VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

1. A sorting and separating method for recycling plastics which are provided in a mixture of plastics as refuse, wherein the method includes separating the plastics according to types of plastic,

~~characterised in that~~wherein

the mixture of plastics is sorted and separated according to colours, and the fractions of plastics thus obtained, separated according to colours, are sorted and separated according to types of plastic.

2. The method as set forth in claim 1, ~~characterised in that~~ wherein the mixture of plastics is sorted and separated according to primary colours, wherein the primary colours are preferably standardised colours, in particular RAL primary colours.

3. The method as set forth in ~~any one of the preceding claims, characterised in that~~ claim 1, wherein the fractions of plastics, separated according to colours, are subjected to extraction in an extractor ~~(8)~~, preferably a carrousel extractor, by means of ethyl acetate as the extraction medium.

4. The method as set forth in ~~any one of the preceding claims, characterised in that~~ claim 1, wherein the mixture of plastics is subjected to an analysis for material degradation, and the plastics contained in the mixture of plastics are sorted and separated according to colours if the analysis establishes that a predetermined degree of degradation has not been exceeded.

5. The method as set forth in ~~any one of the preceding claims, characterised in that~~ claim 1, wherein plastics (LDPE, PP) with different melting temperatures, which are obtained as a mixture by means of or after separation according to colours, are separated thermally by means of a thermal scanner ~~(10)~~.

6. The method as set forth in ~~the preceding~~ claim 5, ~~characterised in that~~ wherein the thermal scanner ~~(10)~~ includes a conveying means ~~(15)~~ comprising a perforated support on which the plastics (LDPE, PP) to be

thermally separated are transported and heated to a temperature at which at least one of the plastics (LDPE, PP) is in a free-flowing and at least one other of the plastics (LDPE, PP) is in a solid state of aggregation.

7. The method as set forth in ~~any one of the preceding two claims~~ claim 6, ~~characterised in that~~ wherein a plastic (LDPE) which has been transferred to a free-flowing state of aggregation by being heated is collected in a cooling bath ~~(18, 22)~~ to be re-solidified.

8. The method as set forth in ~~any one of the preceding claims~~ claim 1, ~~characterised in that:~~ wherein

the mixture of plastics, having been separated from the non-plastics contained in a mixture of material, is washed with a washing fluid, and the washing fluid - together with washed out organic material contained in it - is fed to a bio gas power station ~~(2)~~ comprising a bio gas generator which generates methane gas from the organic material by means of micro-organisms;

the methane gas is combusted in a gas turbine; and

a combustion gas from the gas turbine is used to produce processing energy for sorting and separating the plastics.

9. A plant for recycling plastics and preferably also for recycling other materials contained in a mixture of refuse material, said plant including:

a) a first type-separating means ~~(1, 4, 5)~~ with which plastics and non-plastics are separated;

b) a second type-separating means ~~(9, 10)~~ with which the plastics separated from the non-plastics are separated according to types of plastic ~~.~~;

~~characterised in that~~wherein

c) the plastics from the first type-separating means ~~(1, 4, 5)~~ are transported to a colour separating means ~~(7; 7, 8)~~ in which

the plastics are sorted and separated according to colours and transported in fractions of colours to the second type-separating means ~~(9, 10)~~.

10. The plant as set forth in ~~the preceding~~ claim 9, ~~characterised in that~~ wherein the colour separating means ~~(7, 8)~~ comprises a carrousel extractor ~~(8)~~ in which the fractions of plastics, sorted according to colours, are individually subjected to extraction using a hot extraction medium.

11. The plant as set forth ~~in any one of the preceding claims~~ claim 9, ~~characterised in that~~ wherein the second type-separating means ~~(9, 10)~~ comprises a thermal scanner ~~(10)~~ which comprises a conveying means ~~(15)~~ with a perforated support for plastics and preferably a cooling means ~~(18)~~ arranged underneath the perforated support, in a hot gas tunnel ~~(11)~~.

12. The plant as set forth in ~~any one of the preceding claims, characterised in that: the plant comprises~~ claim 9 further comprising a bio gas power station ~~(2)~~ with a bio gas generator topped by at least one gas turbine~~;~~, wherein:

the bio gas generator generates methane gas, by means of micro-organisms, from the organic material removed from the mixture of material in the plant;

the methane gas is combusted in the gas turbine; and

a combustion gas from the gas turbine is used to produce processing energy and/or the gas turbine is used to produce electrical energy for the plant.

13. The plant as set forth in ~~any one of the preceding claims, characterised in that the plant includes~~ claim 9 further comprising a chip and fibre recycling means ~~(4)~~ with which re-processible chips and fibres are obtained in a multi-stage chemico-thermo-mechanical method from wood refuse separated out from the mixture of material in the plant.

14. The plant as set forth in ~~any one of the preceding claims~~ claim 9, ~~characterised in that:~~ wherein

the plastics are subjected to an analysis for material degradation by means of an analysing means (6); and

plastics are only sorted and separated according to colours if a material degradation of the plastics does not exceed a predetermined degree of degradation, and where they do exceed it, are preferably comminuted into plastic particles to be used as fuel.